THE CHOICE OF CROP ENTERPRISES BASED ON RETURNS FOR LABOR.[1]

PROFESSOR ANDREW BOSS,

UNIVERSITY OF MINNESOTA.

Farm management investigations have been conducted now for something over twenty years. During that time quite a mass of material on cost accounting has been published. Some is now being published on farm organization, and other phases of farm management. I have been more and more impressed during the past years, however, with the fact that although this material is in at least fairly good shape for giving instruction to college classes and for study for investigators, there is not much in it that the farmer can actually use by himself in organizing and operating a farm. It is difficult for the farmer to take any one of these bulletins, analyze it, and apply the findings to his line of work. For that reason I feel that we have not been successful as farm management investigators in getting the ideas of farm management over to him to the point where he can make use of them in his business.

Our next step is to get over to the farmers the salient features of our farm management investigations, and this is not an easy thing to do. Farm management, as such, is a hard subject to sell to the farmers. The farmer is too busy and too much accustomed to routine to change his methods easily. He does not want to change his methods any more than we do. I find in my office work that after I have developed a certain routine it is hard to switch off and to adopt new ideas, and unless I watch myself I soon drop into the old channels. After a farmer has his work mapped out, and after he has followed a certain line of crop or livestock raising a number of years, he is reluctant to change unless shown good reason for it. You have to hit him hard, and with something that will stick if you are going to get him to make a change. To sell the farmer anything in the line of farm management a salesman has to talk a little, he has to work a good deal, and he has to wait a long time. The farmers' interest must be bought by presenting attractively something he can and will use.

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The farmer will listen to the sound of money quicker than to anything else, and it is for that reason that we usually approach him from the business standpoint. Ask him if he wants to make one hundred dollars, and he will immediately become interested; but ask him if he wants to buy a better cow, and he will say "No, I guess the old one will do." If you can approach him through the prospect of making more money, you get a great deal more interest and more thoughtful attention. Profitable production is the farmer's chief concern. He is interested in knowing how to make enough out of his farm to live on and to enable him to procure a reasonable amount of the comforts of life.

The choice of crop enterprise is one way of getting the farmer's attention. I tried this out at our Farmers' Conference during the Short Courses in the College in January. I took this means of presenting to them some features of the market,—a matter which the farmers study very little—and the relation of the market to the profits from their cropping enterprises. I also took this opportunity to bring out some of the facts relative to cropping systems in Minnesota. This is an illustration of what can be done under certain circumstances, and of how it seems possible to get access to the farmers' thought and consideration through some such means. It it with this view of getting hold of the farmer that I want to discuss certain points with the thought that, possibly, together we can work out some way of getting such subjects before a few interested farmers or farm audiences.

1. The choice of crops in most cases is determined by no single consideration but by a number of closely related considerations. Among these are soil type, climate, topography, markets and transportation.

There is no one thing that determines the choice of crops. A good many farmers grow certain crops because their neighbors grow them. Ask them why they grow certain crops, and they will say "The crop thrives well, and we seem to make money on it." As a matter of fact, a good many things enter in. Soil type and climatic conditions determine very largely what a person can grow or cannot grow in a locality. That has been found out by experience over a long period of time. Farmers do not need very much argument to help them decide what crop generally, over any period of time, it is best to grow. Sometimes they make mistakes and have to change their crops. They go gradually from one thing to another, as they are not keen in taking plunges. If they feel a certain line is unprofitable, they may work another line and it may do better.

2. The primary consideration in the mind of the farmer in choosing farm enterprises is the annual return for his labor.

He is interested in what he is going to get at the end of the year from each of his crops, from his livestock and from the year's work on the farm.

3. The total annual return for labor is gained from labor distributed in small quantities over a long period of time and over many farm enterprises. Some of these may not be directly profitable but must be included to support other enterprises that are profitable.

The farmer may be growing a certain crop which we can show him he is growing at a loss when all the factors are considered, but in his situation it is wise for him to grow it for the reason that his business would not be complete without it. Some crops are grown at a low return for the labor expended, but they cannot very well be dispensed with, but these enterprises are always brought back and sandwiched in between those that pay well enough to absorb the losses. The farm management adviser would like to have the farmer eliminate from his farm business those enterprises giving low returns for labor which prevent him from carrying on more remunerative enterprises. It is all right to work for a low price if there is nothing else to do; it is better to be working for a low rate than not to be working at all, but it is a poor business policy to expend very much labor on an enterprise that pays low returns when a higher return is available.

4. So far as possible, the farmer should eliminate from his farm enterprises those which frequently give low returns for labor or that prevent him from performing labor on enterprises that would be more remunerative.

5. It is difficult to find a satisfactory basis for determining which are the most profitable farm enterprises. Where the farm is large enough to furnish employment for the farmer and his family for practically full time, *profits* or *wages* per hour may be used as such a basis. While this consideration alone does not determine the question, it is suggestive and valuable as a study of probable returns.

6. A study of returns per hour of labor becomes possible where the approximate cost of production can be determined and hours of labor required are recorded or known.

7. The exact cost can be determined only where accurate cost records for the individual farm are kept. That there is great variation in cost of production between farmers carrying on the same type of farming and conducting the same enterprises has been amply shown in reports by the Office of Farm Management in recent studies of the cotton and tobacco crops.

This is where I have to break away from what would be the correct usage or the correct method and adopt one which is only approximately correct. I did not think it best to take one of our individual farms and show the cost of this farm over a period of years for each of these crops. In the first place not all the crops are grown on each farm, and in the second place it might not be at all a fair figure to use because on any farm I might take for that time the costs could easily be very much above or below bulkline costs on certain crops. I might have taken a community, but I had no data from a community large enough to be satisfactory. Therefore, I adopted the approximate method of taking the figures from the census for the state as a whole.

8. Studies of average costs and of individual costs as recorded in the various researches now being made give a basis for estimating the probable returns for labor in states, communities and on individual farms.

9. As an educative process these should be made use of by farm management demonstrators as a means of "selling" improved enterprise combinations to farmers.

The report of the farm management survey, recently made on cotton and tobacco crops by the Office of Farm Management of the Department of Agriculture, shows a wide variation in costs even in the same community, and more in different communities. From such data it will be possible to find in any community the men who are producing more economically than the rest of their neighbors; whether or not the other neighbors could do the same thing, and whether it would be wise for them to do it. We may find the men who are efficiently producing certain crops or conducting certain enterprises, study their methods, and try to combine the efficient methods of the different farmers into a good farm organization plan for most of the farmers in the community.

10. The attached tables (which see) give the results of a somewhat crude study of the comparative returns for labor expended on crop enterprises in Minnesota as a whole for the decade 1910–1919.

11. The figures on production are taken from the United States Department Yearbooks. The figures on cost of production are from data gathered on the statistical routes as reported in Bulletins Nos. 145 and 179 of the Minnesota Experiment Station.

As far as the rate for the horse labor is concerned, the figures are taken directly from the bulletins. The bulletin includes no data later than 1917. The data for 1918–1919 are corrections from these tables

SPRING WHEAT.

Crop.	Year.	Acreage.	Production, Bushels.	Yield per Acre, Bu.	Price per Bushel Dec. 1.	Value per Acre.	Cost of Production Less Man Labor.	Net Returns per Acre.	Hrs. of Man Labor.	Returns per Hr. of Man Labor.
Spring Wheat	1910	5,880,000	94,080,000	16.0	.94	15.04	10.33	4.71	12.3	.38
	1911	4,350,000	43,935,000	10.1	.92	9.27	10.33	−1.04	"	−.09
	1912	4,325,000	67,038,000	15.5	.73	11.32	10.33	.99	"	.08
	1913	4,150,000	67,230,000	16.2	.76	12.31	14.71	−2.40	"	−.20
	1914	4,000,000	42,000,000	10.5	1.02	10.71	14.71	−4.00	"	−.33
	1915	4,250,000	72,250,000	17.0	.90	15.30	14.71	.59	"	.05
	1916	3,650,000	26,645,000	7.3	1.66	12.15	14.71	−2.56	"	−.21
	1917	3,230,000	56,525,000	17.5	2.02	35.35	14.71	20.64	"	1.68
	1918	3,730,000	78,330,000	21.0	2.04	42.84	21.59	21.25	"	1.73
	1919	3,804,000	34,236,000	9.0	2.50	23.25	21.59	1.66	"	0.14

CORN.

Corn	1910	1,724,000	56,375,000	32.7	.45	14.72	10.84	3.88	26.2	.15
	1911	2,200,000	74,140,000	33.7	.53	17.86	10.84	7.02	"	.27
	1912	2,266,000	78,177,000	34.5	.37	12.76	10.84	1.92	"	.07
	1913	2,400,000	96,000,000	40.0	.53	21.20	15.00	6.20	"	.24
	1914	2,600,000	91,000,000	35.0	.52	18.20	15.00	3.20	"	.12
	1915	2,700,000	62,100,000	23.0	.62	14.26	15.00	−0.74	"	−.03
	1916	2,520,000	84,420,000	33.5	.80	26.80	15.00	11.80	"	.45
	1917	3,000,000	90,000,000	30.0	1.10	33.00	15.00	18.00	"	.69
	1918	2,750,000	110,000,000	40.0	1.11	44.40	24.20	20.20	"	.77
	1919	2,950,000	118,000,000	40.0	1.20	48.00	24.20	23.80	"	.91

TEN-YEAR AVERAGE.

Crop.	Acreage.	Production, Bushels.	Yield per Acre, Bu.	Price per Bushel Dec. 1.	Value per Acre.	Cost of Production Less Man Labor.	Net Returns per Acre.	Hrs. of Man Labor.	Returns per Hr. of Man Labor.	No. Returns.
Barley.....	1,351,300	33,022,200	24.41	.746	18.21	14.63	3.58	12.8	.28	2 years
Corn.....	2,511,000	86,021,200	34.26	.72	24.67	15.59	9.08	26.2	.347	1 year
Flax.....	335,600	3,040,900	9.05	2.28	20.63	15.54	5.09	13.7	.371	2 years
Oats.....	3,085,400	103,389,200	33.5	.439	14.71	14.45	.26	13.5	.09	7 "
Potatoes.....	265,700	26,951,500	101.5	.722	73.28	37.21	36.07	44.4	.812	1 year
Rye.....	319,800	5,840,400	18.3	.984	18.01	14.19	3.82	10.3	.37	2 years
Spring Wheat..	4,136,900	58,226,900	14.07	1.35	18.99	14.77	4.22	12.3	.343	4 "
Hay—tame....	1,604,100	2,599,500	1.62 Tons	9.42 per Ton	15.26	10.69	4.57	20.7	,22	1 year

based on the present prices of machinery, labor and the various other factors entering into the cost of the crops. The study of such figures for a single year is futile. It may be valuable as a mental exercise or as an indoor sport, but it does not tell very much. Farm management data should be secured through a long period of time in order to record the variations and extremes. Figures on cost of production for a twenty-year period would be better than for the ten-year period, but the ten-year period will answer for our purpose.

12. Data by years are given for the two most important crops grown by Minnesota farmers, namely, spring wheat and corn, to show the influence of poor yields or low prices on the returns for labor. A summary table showing the average returns from the eight most important crops is also given.

I selected for this purpose the two main crops grown by the farmers in Minnesota (not commonly supposed to be in the corn belt, but corn has become one of the most important crops grown in Minnesota, as far as the value is concerned, and it is becoming important as far as the acreage is concerned). A study by years seems to be absolutely essential to a clear understanding of the problem.

The acreage production of spring wheat has constantly decreased from 1910 to 1917 inclusive. There is a slight increase in 1915 over 1914, but this is held only for one year. In 1918 the acreage was increased as the result of the food production campaign by the Department of Agriculture. The 17.5 bushels yield at the price of $2.02 in 1917 and the $1.66 in 1916 probably had a good deal to do with it as well. The increased price in 1914 resulted in the increased acreage in 1915. The price per bushel has something to do with the wheat acreage. For comparison it has seemed best to take the December 1 price right through, though farmers do not always sell their wheat on that date. It usually brings more if held until spring.

13. How often out of ten years can a farmer expect to work on a wheat crop and receive nothing for his labor? The frequency ought to be of some value as an indication. It will be noted that spring wheat has failed to pay any wages whatsoever for labor four years out of the ten. Corn has failed to pay only one year out of ten. Similar studies of other crops show that barley has given no return for man labor two years out of ten, flax two, potatoes one, fall rye two, and hay one. Oats have failed to pay any wage for man labor seven years out of ten.

14. Based on wage rate per hour only, the crops stand in the following order: (1) potatoes, 81.2 cents per hour; (2) flax, 37.1 cents; (3) fall rye, 37 cents; (4) corn, 34.7 cents; (5) spring wheat, 34.3

cents; (6) barley, 28 cents; (7) hay, 22 cents, and (8) oats, 9 cents per hour.

You will note the cost of production is given in three-year periods and then in a five-year period. This is due to the fact that we used figures from bulletin 145 for the first three years, and for the next five years we used figures from bulletin 179, with a correction of 179 for 1918 and 1919. These figures include all of the costs as we customarily determine them, except the man labor cost. That was omitted.

The cost for the use of land, machinery, twine, cost of seed, and general expense is charged in.

The net returns per acre are determined. The hours of labor are taken from bulletin 157, which gives the average requirement of man and horse labor for each of the crops—12$\frac{3}{10}$ hours is the average requirement for wheat. Divide the net returns per acre by the hours of labor, and you have the return per hour of man labor.

The wheat crop during the ten-year period, followed up on the basis of wages per hour shows that wheat in Minnesota as a whole was raised at a loss four years out of the ten and grown for a very low wage rate during 1912 and 1915. In 1912 there was a good yield, better than the average yield for the State, but a low price, which resulted in only 8 cents per hour for man labor. (This brings out the point that if a man has nothing to do, it is better to get 8 cents than nothing at all.) In 1915 there is a good yield, amounting to 17 bushels per acre, but at only 90 cents per bushel. The cost of raising wheat having gone up during this period, the wage rate returned for 1915 is only 5 cents an hour.

There are only three years out of the ten when the spring wheat crop paid what would be considered a fairly good wage rate—38 cents an hour in 1910; $1.68 an hour in 1917, and $1.73 an hour in 1918.

The price is better in 1919, with the acreage better than in 1918 but with a lower average yield, which reduces the wage per hour.

One of the things the farmer is always up against, no matter how good a workman he is, is that some uncontrollable factor may come in to upset his calculations and lower his yield, and then only the high price of wheat will enable him to get through with any wage rate at all. Our farmers still have faith in wheat. There are no actual returns as yet for 1920, but our judgment is, and preliminary reports indicate, that there is no serious decrease in wheat acreage this year. It looks like a good wheat year. The shortage of labor, perhaps, had

something to do with the putting in of wheat crops in preference to some other crops which called for more labor. Corn in Minnesota, for the ten-year period, has as good a showing as wheat, with an increasing ratio instead of a decreasing. It may be that the wheat acreage was turned over to the growing of corn. With the increase in acreage, there is an increase in the yield per acre as well. There is almost a constant increase in the price of corn since 1910.

There is only one year out of ten in which corn has paid nothing for the labor, or less than nothing—1915, when we had a yield of only 23 bushels per acre, corn was raised at a loss. In none of the years (excepting 1919) did corn pay as high a wage rate per hour as did wheat in two of the years. Upon referring to the next paragraph of the table, however, you will notice that corn and wheat, as far as the average for the ten-year period is concerned, are right close together, with corn having just a shade better showing. Wheat four years out of the ten gave no returns at all. Corn has become as safe a crop and as profitable a crop in Minnesota (this having nothing whatever to do with the listed figures) as spring wheat. The most profitable crop is potatoes, paying 81 9/10 cents per hour for the labor expended on the crop. Potatoes have a comparatively small acreage in the state—not quite 2 acres to a farm with 156,000 farms in the state. Rye has about two acres per farm. Flax, rye and potatoes are grown in restricted localities and not commonly grown crops on all of the farms of the state. Flax is grown on new land, sometimes on new farms in the timber sections, but not very often. The acreage is decreasing. The fall rye crop is adapted to the state but the farmers generally do not grow it. It is grown through the sandy region, that dries out quickly, during the latter part of the summer. The fall crop is preferred as it can be harvested before the hot weather comes on.

As far as the crop reports are concerned, there are 65,000 acres of winter wheat in Minnesota, which pays 64 cents an hour for labor expended on the crop compared with 37 cents an hour for spring wheat crop for the same years. There is a limited acreage in the most favorable part of the state, but winter wheat can in no sense be compared with the spring wheat area which covers practically the whole two thirds or three fourths of the state, all excepting in the northeastern part of the state.

Oats seven years out of the ten were grown at a loss, giving no wages for the labor expended. Notwithstanding that fact, the farmers are growing a larger acreage of that crop than any other except

spring wheat. As the acreage of spring wheat decreases, the oats increase in spite of the fact that they seem to be the most unprofitable crop of all.

15. On returns per hour of labor it appears that more potatoes should be grown. It would seem that the acreage of potatoes could well be increased at the expense of the oat crop. The labor demand of potatoes is heavy, however, and the crop competes more closely with corn than does oats for the farmer's time. The crop is a perishable one also which cannot be stored indefinitely. For these reasons the potato acreage is likely to be comparatively limited.

The first thing that strikes one if we give credence to the figures is why work for 9 cents on oats if you can make 81 cents on potatoes? Climatic, market and labor conditions, and soil type affect the growth of both crops. Potatoes grow fairly well in most parts of the state, but there are some places where they do better than in others. There is one local area in the northwestern part of the state and another in the northeastern part of the state where potato growing is well developed. In the east central part of the state and immediately surrounding the Twin Cities there is more territory in which potato raising is extensively conducted. The first-named areas are shipping communities, the last two have been developed more particularly to meet the needs of the Twin Cities. Each of these areas is capable of expansion.

On most farms of the state, however, potatoes are grown only on a small acreage and the crop is looked upon as a minor one. The farmers have not realized the possible profits from potato-growing, nor have they equipment for growing potatoes on a large scale at low cost.

The labor demand on a potato crop is heavy. Potatoes compete more closely with corn than it does with oats. This is particularly true during the cultivating season. In addition to cultivating, successful potato growing calls for repeated spraying and other care. This operation interferes both with corn cultivation and hay making. Briefly, most farmers consider that potato raising is a heavy and a troublesome kind of a job, and one that is not so well adapted to machinery use as raising oats or corn, therefore, they hesitate to undertake a large acreage. With the development of machinery for potato raising, with better systems of marketing and more knowledge of the crop, it is altogether likely that potato raising will to some extent replace the oat and other low-profit crops.

Another factor to note regarding the potato crop is that it is perishable, and cannot be carried over, therefore the crop is all marketed

well within the winter season, or it will be lost or used as a feed crop. Potatoes can be grown in almost any part of the state, but it is not a profitable crop in every part of the state, therefore it should be grown as a market crop in those areas where it succeeds best.

16. The practice of Minnesota farmers in growing wheat and corn largely seems to be warranted by the returns received. Some other explanation than returns for labor must be given for the continued growth of the oat crop. The explanation may lie in the demand for oats as a feed crop or to their influence on the livestock industry and the consequent provision of winter employment. It would seem that the flax acreage also could be increased to a considerable extent at the expense of the oat acreage.

A study of the table shows the uncertainty of profits from wheat raising. During the 10-year period, there are two or three years of good yields when prices were high. Fairly good wages were paid for the whole period, but it is not a sure profit crop in all parts of the state. In some parts of the state oats is a surer crop than spring wheat and may pay a higher wage return.

A study of climate, soil and markets is essential in determining what is the best for any community. A study of this kind made in communities would be highly desirable.

In the matter of getting the talking points for farm management among the farmers, we ought to have this by counties, and it seems to me it is the business of the research department to go into the typical counties and get relative costs and returns from various crops so as to know what is best in different communities. I hope out of this suggestion there may come something that will serve to stimulate that sort of inquiry. Cost accounting records in a good many of these localities would be well worth while. Through the help of the farm management research men, through the research department or the extension department, the farm management demonstrator can go into certain typical localities and get data for it and make comparisons by limited localities. I do not think we can at once change the customs or cropping practices of farmers, but such studies will give us a very much better understanding of the crop conditions than we have been able to get in the past, and will give a fund of knowledge that will enable us to go to the farmer with a message that will interest him. If we are able to talk facts that apply to his locality, and if these facts can be built up around the practices of the particularly efficient farmer, the farmer who has made the highest wage rate per hour, so much the better. If that can be made the test for comparison with certain other types of farms, it will be a factor in correcting

farm practices and in developing new combinations of crop enterprises, and possibly livestock enterprises. Just how valuable this information will be, I am not able to say, but I am satisfied from this preliminary study that there is a chance for a much more comprehensive study of the conditions in limited localities, with the chances of getting some very good information that farmers, or at least the farm management demonstrator, can use.

One other point mentioned in 16, flax is one of the well-paying crops, paying 3 cents an hour better than corn or wheat. Notwithstanding that fact, the flax acreage is shrinking. It would seem that the acreage ought to be increased. The reason it is not increased is because the prairie land is vanishing and the farmers have always grown flax on prairie land, and think it can be grown only on such land, notwithstanding the fact that we can get good yields on much of the old land of southern Minnesota. The farmer may be able to handle more acres of flax than of oats because he can spread it over a longer seeding season—can sow from the 20th of April until the 1st of July if necessary, and can harvest it most any time.

17. A study of returns per hour of man labor on crop enterprises should be accompanied by an estimate of the seasonal labor demand by each and of the possibility of supplying it from the labor available. The function of each crop in the farm organization scheme also must be considered in relation to the returns on labor expended on the farm as a whole.

18. It is impossible to determine once for all which will be the most profitable crops or enterprises. Changes in prices for crops make it necessary to change from one to the other, rising land values or fluctuations in rent without corresponding changes in value of products may make it necessary to introduce new crops or change the proportions of the old ones. A frequent study of the economic factors of production and a knowledge of market trends often enable one to take advantage of possible opportunities for profitable production of higher wage returns for labor expended.